

Appln. No. 10/007,468
Amendment dated April 26, 2005
Reply to Office Action of January 26, 2005

REMARKS/ARGUMENTS

Reconsideration of the present application, as amended, is respectfully requested.

The January 26, 2005 Office Action and the Examiner's comments have been carefully considered. In response, claims are amended and remarks are set forth below in a sincere effort to place the present application in form for allowance. The amendments are supported by the application as originally filed. Therefore, no new matter is added.

Inasmuch as the present Amendment raises no new issues for consideration, and, in any event, places the present application in condition for allowance or in better condition for consideration on appeal, its entry under the provisions of 37 CFR 1.116 are respectfully requested.

PRIOR ART REJECTIONS

In the Office Action claims 1-8 and 12-17 are rejected under 35 USC 102(b) as being anticipated by USP 5,490,000 (Tanaka et al.). Claims 9-11, 18 and 19 are rejected under 35 USC 103 as being unpatentable over Tanaka et al. in view of USP 6,825,823 (Taira et al.).

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In response, independent claims 1 and 12 are amended to more clearly define the present claimed invention over the cited references.

The present claimed invention as defined by amended claim 1 is directed to a liquid crystal display device including a liquid crystal display panel having a plurality of signal lines, a plurality of scanning lines, and a plurality of display pixels arrayed in a matrix and provided respectively near cross-points between the signal lines and the scanning lines through switching elements. The liquid crystal display device also includes a driver which supplies the plurality of signal lines with a display signal in a field period, and which supplies the plurality of scanning lines with a scanning signal, to apply the display signal to the plurality of display pixels. The driver includes means which supplies an initialization signal including a single pulse voltage to the signal line and supplies a first gate pulse as the scanning signal to the scanning line, thereby applying the initialization signal to the display pixel, and thereafter supplies the display signal to the signal line and supplies a second gate pulse as the scanning signal to the scanning line, thereby applying the display signal to the display pixel, at least one signal application period set within the field period.

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The drive control method according to amended claim 12 is for a liquid crystal display device which has a plurality of signal lines, a plurality of scanning lines, and a plurality of display pixels arrayed in a matrix and provided respectively near cross-points between the signal lines and the scanning lines through switching elements, and which supplies the plurality of signal lines with a display signal in a field period and supplies scanning signals to the plurality of scanning lines, to apply the display signal to the plurality of display pixels. The method includes the steps of providing at least one signal application period in the field period, applying an initialization signal including a single pulse to the display pixel, by supplying the initialization signal voltage to the signal line and supplying a first gate pulse as the scanning signal to the scanning line, and applying the display signal to the display pixels by supplying the display signal to the signal line and supplying a second gate pulse as the scanning signal to the scanning line after completion of applying the initialization signal voltage in the signal application period.

A liquid crystal display device and a driving control method thereof as recited in amended claims 1 and 12 includes a structure which is capable of applying an initialization signal voltage consisting of a single pulse, in accordance with a first

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gate pulse, within one of signal application periods in a field period, and thereafter, applying a display signal to a display pixel in accordance with a second gate pulse. The initialization signal voltage in the present claimed invention is intended as voltage VMAX as indicated in Figs. 2A to 2C, and 5A to 5C, and it consists of a single pulse.

USP 5,490,000 (Tanaka et al.) is directed to a driving method for a ferroelectric liquid crystal element. In Figs. 12A to 12H, Tanaka et al. disclose a structure wherein the column driver 22 simultaneously applies a positive first reset pulse P12 with the negative second reset pulse P12 to all of the data line 6, as the initialization signal voltage, in accordance with the gate pulse applied in a first half selection period.

The initialization signal voltage of the present claimed invention consists of a single pulse. In contrast, the initialization signal voltage of Tanaka et al. consists of two pulses, which are the positive pulse and the negative pulse. Therefore, it is clear that the initialization signal voltage of the present claimed invention is different from that disclosed in Tanaka et al.

Furthermore, Tanaka et al. is related to driving a ferroelectric liquid crystal element. A liquid crystal is oriented to a first stable state by applying the positive first

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reset pulse, and oriented to a second stable state by applying the negative second reset pulse. An orientation state just before applying a writing voltage is kept constant in every selection period by applying both of the reset pulses, thereby making the value of the writing voltage correspond to light transmittance. In other words, in Tanaka et al., it is not possible to accomplish its goal by applying only one of the first reset pulse and the second reset pulse. Therefore, the structure of the present claimed invention as defined by claims 1 and 12 in which the initialization signal voltage consists of a single pulse is not disclosed, taught or suggested in Tanaka et al.

Taira et al. and the other references of record do not close the gap between the present claimed invention as defined by amended claims 1 and 12 and Tanaka et al. Therefore, the present claimed invention as defined by claims 1 and 12 is patentable over Tanaka et al. taken either alone under 35 USC 102 or in combination with any of the other references of record under 35 USC 103.

Claims 2-11 and 13-19 are either directly or indirectly dependent on claims 1 or 12 and are patentable over the cited references in view of their dependence on claims 1 or 12 and because the references do not disclose, teach or suggest each of limitations set forth in claims 2-11 and 13-19.

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In view of all of the foregoing, claims 1-19 are in form for immediate allowance, which action is earnestly solicited.

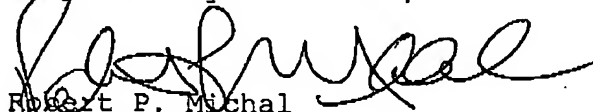
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Entry of this Amendment under the provisions of 37 CFR 1.116, allowance of the claims and the passing of this application to issue are respectfully solicited.

If the Examiner disagrees with any of the foregoing, the Examiner is respectfully requested to point out where there is support for a contrary view.

If the Examiner has any comments, questions, objections or recommendations, the Examiner is invited to telephone the undersigned at the telephone number given below for prompt action.

Respectfully submitted,



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